

### Abstract of the Invention

A turbine engine exhaust diffuser assembly having a tuneable exhaust velocity profile is disclosed. The assembly includes structure that generates a desired, tuneable velocity profile within working fluid exiting the exhaust diffuser assembly. The exhaust  
5 assembly includes an concentric boundary sleeves that extend along a central axis and form an exhaust flowpath between them. A flow deflecting member disposed within the flowpath longitudinally divides the flowpath into a first region and a second region. The first region is characterized by a first predetermined velocity profile, and the second region is characterized by a second predetermined velocity profile. The second velocity profile is  
10 determined by at least one pre-selected dimension of the flow deflecting member. Methods of maximizing HRSG energy extraction capacity and extending HRSG lifespan are also disclosed.